

**BEFORE THE
PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA**

DOCKET NO. 2022-1-E

In the Matter of)	DIRECT TESTIMONY OF
Annual Review of Base Rates for Increase in)	BRETT PHIPPS FOR
Fuel Costs for Duke Energy Progress, LLC)	DUKE ENERGY PROGRESS, LLC

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Brett Phipps. My business address is 526 South Church Street, Charlotte, North
3 Carolina 28202.

4 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5 A. I am employed as Managing Director, Fuel Procurement, for Duke Energy Corporation
6 ("Duke Energy"). In that capacity, I directly manage the organization responsible for the
7 purchase and delivery of coal to Duke Energy's regulated generation fleet, including Duke
8 Energy Progress, LLC ("DEP" or the "Company") and Duke Energy Carolinas, LLC
9 ("DEC"). In addition to fuels, I also supervise the procurement of all reagents.

10 **Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL**
11 **EXPERIENCE.**

12 A. I have a Bachelor of Science degree in Chemistry from Marshall University. I began in
13 the mining industry in 1993 where I held various roles associated with surface mining
14 operations. I joined Progress Energy in 1999, holding roles in terminal operations and
15 sales and marketing for Progress Ventures, Progress Energy's unregulated business. I
16 transitioned to the regulated utility in 2005, where I worked in various coal procurement
17 functions and leadership roles, ending as Director, Coal prior to the merger with Duke
18 Energy. In July 2012, upon consummation of the merger between Duke Energy and
19 Progress Energy, I was named as Director, Fuel Procurement. The position was retitled as
20 Managing Director, Fuel Procurement in 2014. I am a member of the American Coal
21 Council, The Coal Institute, the Lexington Coal Exchange, and Southern Gas Association
22 and was previously a board member of the American Coal Council from 2018 to 2020.

23 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS**

MANAGING DIRECTOR, FUEL PROCUREMENT.

A. As Managing Director, Fuel Procurement, I participate in all aspects of the overall strategic direction and commercial management of the purchase, delivery, and storage of fossil fuels that the Duke Energy regulated utilities use for the generation of electricity. This includes monitoring and providing guidance in the various areas of fuel markets, including feedback regarding supply and demand, price, quality, availability, economics, and deliverability. These fuel reviews cover both existing and potential future supply sources. I also supervise the Company's coal procurement activity and associated transportation, including the negotiation and administration of long-term and short-term-purchase contracts. In addition to coal, I supervise procurement of reagents (products used by environmental control systems) and the overall fuel inventories for the regulated fossil generation fleet. Up until August 1, 2021, I also oversaw the procurement of natural gas, fuel oil, and optimization of emission allowances. Duke Energy recently created the new role of Managing Director-Natural Gas and consolidated oversight of natural gas, fuel oil, and emissions under that role effective August 1, 2021. The focus of my role will remain on managing the coal supply chain to ensure reliability and cost-effective supply. In my role as Managing Director, Fuel Procurement, I provide testimony regarding Duke Energy's fossil fuel procurement practices in Duke Energy Indiana and have done so since 2013. Additionally, I provide testimony regarding Duke Energy's fossil fuel procurement practices in Duke Energy Kentucky's fuel proceedings as required.

Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION IN ANY PRIOR PROCEEDINGS?

A. Yes. I testified before the Public Service Commission of South Carolina ("Commission") in

DEP's 2017, 2019, and 2021 fuel cost proceedings in Docket Nos. 2017-1-E, 2019-1-E, and 2021-1-E, as well as in DEC's 2017, 2019, and 2021 fuel cost proceedings in Docket Nos. 2017-3-E, 2019-3-E and 2021-3-E.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to describe DEP's fossil fuel purchasing practices, provide actual fossil fuel costs for the period March 1, 2021 through February 28, 2022 ("review period") versus March 1, 2020 through February 29, 2021 ("prior review period"), and describe changes forthcoming for the period July 1, 2022 through June 30, 2023 ("billing period").

Q. YOUR TESTIMONY INCLUDES TWO EXHIBITS. WERE THESE EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes. These exhibits were prepared at my direction and under my supervision, and consist of Phipps Exhibit 1, which summarizes the Company's Fossil Fuel Procurement Practices, and Phipps Exhibit 2, which summarizes total monthly natural gas purchases and monthly contract and spot coal purchases during the review period and the prior review period.

Q. PLEASE PROVIDE A SUMMARY OF DEP'S FOSSIL FUEL PROCUREMENT PRACTICES.

A. A summary of the Company's fossil fuel procurement practices is set out in Phipps Exhibit 1.

Q. PLEASE DESCRIBE THE COMPANY'S APPROACH TO UNIT COMMITMENT AND DISPATCH OF ITS GENERATION ASSETS TO RELIABLY AND ECONOMICALLY SERVE ITS CUSTOMERS.

1 A. Both DEP and DEC perform the same detailed daily process to determine the unit
2 commitment plan that economically and reliably meets the Company's projected system
3 needs over the next seven days. The Company utilizes a production cost model to determine
4 an optimal unit commitment plan to economically and reliably meet system requirements.
5 The model minimizes the production costs needed to serve the projected customer demand
6 within reliability and other system constraints over a period of time. Inputs to the model
7 include, but are not limited to, the following: (1) forecasted customer energy demand; (2) the
8 latest forecasted fuel prices, reflective of market supply chain dynamics; (3) variable
9 transportation rates; (4) planned maintenance and refueling outages at the generating units;
10 (5) generating unit performance parameters; (6) reliability constraints such as units run to
11 maintain day-ahead planning reserves or units required to run for transmission or voltage
12 support; and (7) expected market conditions associated with power purchases and off-system
13 sales opportunities. The production cost model output produces the optimized hourly unit
14 commitment plan for the 7-day forecast period. This unit commitment plan also provides the
15 starting point for dispatch, but dispatch is then also subject to real time adjustments due to
16 changing system conditions including management of natural gas transportation constraints.
17 The unit commitment plan is prepared daily and adjusted, as needed, throughout any given
18 day to respond to changing real time system conditions.

19 **Q. PLEASE DESCRIBE THE COMPANY'S DELIVERED COST OF COAL AND**
20 **NATURAL GAS DURING THE REVIEW PERIOD.**

21 A. The Company's average delivered cost of coal per ton for the review period was \$82.65 per
22 ton, compared to \$96.35 per ton in the prior review period, representing a decrease of
23 approximately 14%. The cost of delivered coal includes an average transportation cost of

1 \$33.60 per ton in the review period, compared to \$39.38 per ton in the prior review period,
2 representing a decrease of approximately 15%. The Company's average price of gas
3 purchased for the review period was \$5.34 per Million British Thermal Units ("MMBtu"),
4 compared to \$3.72 per MMBtu in the prior review period, representing an increase of 43%.
5 The cost of gas is inclusive of gas supply, transportation, storage, and financial hedging.

6 DEP's coal burn for the review period was 2.9 million tons, compared to a coal burn
7 of 3.4 million tons in the prior review period, representing a decrease of 14%. The Company's
8 natural gas burn for the review period was 170.3 million MBtu compared to a gas burn of
9 158.7 million MBtu in the prior review period, representing an increase of 7%.

10 Changes in coal and natural gas burns were primarily driven by increased demand
11 from the economic rebound experienced following the COVID-19 shutdowns in 2020.
12 Rapidly escalating coal commodity prices in the latter half of 2021 and early 2022 off-set the
13 overall increase in natural gas prices, reducing gas to coal switching.

14 **Q. PLEASE DESCRIBE THE LATEST TRENDS IN COAL AND NATURAL GAS**
15 **MARKET CONDITIONS.**

16 A. Coal markets continue to be distressed, and there has been increased market volatility due to
17 a number of factors, including: (1) deteriorated financial health of coal suppliers following the
18 past several years of steep declines in coal generation demand, which has impacted the ability
19 of producers to respond to changes in demand during 2021 and early 2022; (2) natural gas
20 price volatility; (3) renewed uncertainty from the new administration regarding proposed and
21 imposed U.S. Environmental Protection Agency regulations for power plants; (4) increased
22 demand in global markets for both steam and metallurgical coal; (5) uncertainty surrounding
23 regulations for mining operations; (6) tightening access to investor financing, coupled with

1 deteriorating credit quality is increasing the overall costs of financing for coal producers; (7)
2 continued shifts in production from thermal to metallurgical coal as producers move away
3 from supplying declining electric generation to take advantage of increasing demand from
4 industry; and (8) increasing labor and resource constraints due to structural changes in the
5 coal industry further limiting suppliers' operational flexibility. In addition, the coal supply
6 chain experienced increasing challenges throughout 2021 as historically low utility
7 stockpiles—combined with rapidly increasing demand for coal, both domestically and
8 internationally—made procuring additional coal supply increasingly challenging. Producers
9 were unable to respond to this rapid rise in demand due to capacity constraints resulting from
10 labor and resource shortages. These factors combined to drive both domestic and export coal
11 prices in 2021 and early 2022 to record levels.

12 Declining demand for coal in the utility sector has also driven rail transportation
13 providers to modify their business models to be less dependent on coal related transportation
14 revenues. Although rail transportation providers are required to provide rail service, the
15 Company's rail transportation providers have limited resources to adapt to significant changes
16 in scheduling demand resulting from the Company's burn volatility, specifically in higher
17 than forecasted coal burn scenarios. In 2021 and early 2022, the Company experienced
18 increased delivery delays created by rail transportation labor and resource shortages.

19 With respect to natural gas, the nation's natural gas supply has grown significantly
20 over the last several years as producers enhanced production techniques, enhanced
21 efficiencies, and lowered production costs. Natural gas prices are reflective of the dynamics
22 between supply and demand factors, and in 2021 and early 2022, such dynamics were
23 influenced primarily by growth in export demand, stable production, lower than average

1 storage inventory balances, and seasonal weather demand. While there continues to be
2 adequate natural gas production capacity, there is a growing need for natural gas pipeline
3 infrastructure to serve increased market demand. Conversely, pipeline infrastructure
4 permitting and regulatory process approval efforts are increasingly challenged and taking
5 longer due to increased reviews and interventions, which can delay and change planned
6 pipeline construction and commissioning timing. The Federal Energy Regulatory
7 Commission is in the process of developing policy for additional project requirements to
8 include an analysis of environmental and social impacts on new pipeline infrastructure.

9 Over the longer term planning horizon, natural gas supply has the ability to respond
10 to changing demand while the pipeline infrastructure needed to move the growing supply to
11 meet demand related to power generation, liquefied natural gas exports, and pipeline exports
12 to Mexico is highly uncertain.

13 **Q. WHAT ARE THE PROJECTED COAL AND NATURAL GAS CONSUMPTIONS**
14 **AND COSTS FOR THE BILLING PERIOD?**

15 A. DEP's current coal burn projection for the billing period is 2.4 million tons compared to 2.9
16 million tons consumed during the review period. DEP's billing period projections for coal
17 generation may be impacted due to changes from, but not limited to, the following factors:
18 (1) delivered natural gas prices versus the average delivered cost of coal; (2) volatile power
19 prices; and (3) electric demand. Combining coal and transportation costs, DEP projects
20 average delivered coal costs of approximately \$88.34 per ton for the billing period compared
21 to \$82.65 per ton in the review period. This increase in delivered costs is primarily driven by
22 increased coal commodity costs due to limited coal supply and increased domestic and
23 international demand. This includes an average projected total transportation cost of \$31.30

1 per ton for the billing period, compared to \$33.60 per ton in the review period. This projected
2 delivered cost, however, is subject to change based on, but not limited to, the following
3 factors: (1) exposure to market prices and their impact on open coal positions; (2) the amount
4 of Central Appalachian coal DEP is able to purchase and deliver and the non-Central
5 Appalachian coal DEP is able to consume; (3) changes in transportation rates; (4) performance
6 of contract deliveries by suppliers and railroads which may not occur despite the Company's
7 strong contract compliance monitoring process; and (5) potential additional costs associated
8 with suppliers' compliance with legal and statutory changes, the effects of which can be
9 passed on through coal contracts.

10 DEP's current natural gas burn projection for the billing period is approximately 158.3
11 million MBtu, compared to 170.3 million MBtu consumed during the review period. The
12 current average forward Henry Hub price for the billing period is \$4.52 per MMBtu compared
13 to \$4.26 per MMBtu in the review period. Projected natural gas burn volumes will vary based
14 on factors such as, but not limited to, changes in actual delivered fuel costs and weather driven
15 demand.

16 **Q. WHAT IMPACTS DOES DEP ANTICIPATE DUE TO THE DECLINES IN**
17 **EXPECTED COAL BURNS AND CHANGES IN THE ABILITY OF THE**
18 **RAILROAD TO MEET SIGNIFICANT CHANGES IN COAL DEMAND?**

19 A. First, the Company's Fixed/Variable coal rail transportation contracts that expired June 30,
20 2021 did not provide ongoing customer value in a declining coal burn environment. Second,
21 declining operational flexibility on the part of the Company's coal rail transportation
22 providers will limit their ability to adapt timely to significant changes in coal demand. As an
23 alternative to returning to a flat conventional rate structure, the Company negotiated a 100

1 percent variable tiered pricing contract structure with the goal of achieving a structure that
2 provides incremental customer value (as compared to a 100 percent variable flat conventional
3 rate structure) and supports secure, reliable deliveries in an overall lower coal burn
4 environment.

5 **Q. HAS THIS NEW RAIL RATE STRUCTURE IMPACTED THE COMPANY'S UNIT**
6 **COMMITMENT AND DISPATCH MODELING WHEN COMPARED TO THE**
7 **PREVIOUS RAIL RATE STRUCTURE? IF SO, HOW HAS THE COMPANY**
8 **INCORPORATED THE NEW TIERED PRICING INPUTS?**

9 A. Yes, DEP anticipated that moving to a new tiered contract structure would require a more
10 dynamic input process to incorporate the new tiered pricing structure into the Company's unit
11 commitment and dispatch modeling process. The rail transportation pricing input in unit
12 commitment and dispatch will be the current Weighted-Average Balance of Contract
13 Transportation Rate ("Weighted-Average Rate"), updated weekly. The process for
14 calculating the current Weighted-Average Rate will be to use the Company's stochastic
15 production cost model to estimate the remaining coal tons to be delivered for the balance of
16 the contract period and calculate the weighted-average transportation rate for those tons based
17 on the contract's tiered rate structure and tons already delivered. Then, that Weighted-
18 Average Rate is used in the next unit commitment and dispatch decisions. This rate is
19 recalculated every week to account for updated actual delivered tons and changes in the
20 projected final tons as other inputs (e.g., fuel prices) change in the production cost model.

21 **Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF THE COMPANY'S STOCHASTIC**
22 **PRODUCTION COST MODEL.**

1 A. The stochastic model uses historic weather information to simulate numerous scenarios of
2 future weather and commodity prices. For each of these scenarios, system load and
3 commodity prices (gas, coal, oil, and power) are all calculated in a correlated manner using
4 historical correlations with each other and with weather. The resulting forecasts of this
5 stochastic model give the Company not only expected fuel burns, but also the range of fuel
6 burns and the probability associated with each range.

7 **Q. WHAT STEPS IS DEP TAKING TO ENSURE A COST-EFFECTIVE AND**
8 **RELIABLE FUEL SUPPLY?**

9 A. The Company continues to maintain a comprehensive coal and natural gas procurement
10 strategy that has proven successful over the years in limiting average annual fuel price changes
11 while actively managing the dynamic demands of its fossil fuel generation fleet in a reliable
12 and cost effective manner. With respect to coal procurement, the Company's procurement
13 strategy includes: (1) having an appropriate mix of term contract and spot purchases for coal;
14 (2) staggering coal contract expirations in order to limit exposure to forward market price
15 changes; and (3) diversifying coal sourcing as economics warrant, as well as working with
16 coal suppliers to incorporate additional flexibility into supply contracts. The Company
17 conducts spot market solicitations throughout the year to supplement term contract purchases,
18 taking into account changes in projected coal burns and existing coal inventory levels.
19 Additionally, the Company negotiates coal transportation contracts that support secure,
20 reliable deliveries in a lower coal burn environment.

21 The Company has implemented natural gas procurement practices that include
22 periodic Request for Proposals and shorter-term market engagement activities to procure and
23 actively manage a reliable, flexible, diverse, and competitively priced natural gas supply.

1 These procurement practices include contracting for volumetric optionality in order to provide
2 flexibility in responding to changes in forecasted fuel consumption. DEP continues to
3 maintain a short-term natural gas hedging plan to manage fuel cost risk for customers via a
4 disciplined, structured execution approach. DEP continues to monitor and make adjustments
5 as necessary to its natural gas hedging program.

6 Lastly, the Company procures long-term firm interstate and intrastate transportation
7 to provide natural gas to its generating facilities. Given the Company's limited amount of
8 contracted firm interstate transportation, the Company purchases shorter term firm interstate
9 pipeline capacity as available from the capacity release market. The Company's firm
10 transportation ("FT") provides the underlying framework for the Company to manage the
11 natural gas supply needed for reliable and cost-effective generation. First, it allows the
12 Company access to lower cost natural gas supply from Transco Zone 3 and Zone 4 and the
13 ability to transport gas to Zone 5 for delivery to the Carolinas' generation fleet. Second, the
14 Company's FT allows it to manage intraday supply adjustments on the pipeline through
15 injections or withdrawals of natural gas supply from storage, including on weekends and
16 holidays when the gas markets are closed. Third, it allows the Company to mitigate imbalance
17 penalties associated with Transco pipeline restrictions, which can be significant. The
18 Company's customers receive the benefit of each of these aspects of the Company's FT:
19 access to lower cost gas supply, intraday supply adjustments at minimal cost, and mitigation
20 of punitive pipeline imbalance penalties.

21 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

22 **A.** Yes, it does.

Duke Energy Progress, LLC Fossil Fuel Procurement Practices

Coal

- Near and long-term coal consumption is forecasted based on inputs such as load projections, fleet maintenance and availability schedules, coal quality and cost, non-coal commodity and emission prices, environmental permit and emissions constraints, projected renewable energy production, and wholesale energy imports and exports.
- Station and system inventory targets are developed to provide generational reliability, insulation from short-term market volatility, and adaptability to evolving coal production and transportation conditions. Inventories are monitored continuously.
- On a continuous basis, existing purchase commitments are compared with consumption and inventory requirements to determine changes in supply needs.
- All qualified suppliers are invited to participate in Request for Proposals to satisfy additional supply needs.
- Spot market solicitations are conducted on an on-going basis to supplement existing purchase commitments.
- Contracts are awarded based on the highest customer value, considering factors such as price, quality, transportation, reliability and flexibility.
- Delivered coal volume and quality are monitored against contract commitments. Coal and freight payments are calculated based on certified scale weights and coal quality analysis meeting ASTM standards as established by ASTM International.

Gas

- Near and long-term natural gas consumption is forecasted based on inputs such as load projections, commodity and emission prices, projected renewable energy production, and fleet maintenance and availability schedules.
- Physical procurement targets are developed to procure a cost effective and reliable natural gas supply.
- Natural gas supply is contracted utilizing a portfolio of long term, short term, spot market and physical call option agreements
- Short-term and long-term Requests for Proposals and market solicitations are conducted with potential suppliers, as needed, to procure the cost competitive, secure, and reliable natural gas supply, firm transportation, and storage capacity needed to meet forecasted gas usage.
- Short-term and spot purchases are conducted on an on-going basis to supplement term natural gas supply.
- On a continuous basis, existing purchases are compared against forecasted gas usage to determine changes in supply and transportation needs.
- Natural gas transportation for the generation fleet is obtained through a mix of long-term firm transportation agreements, and shorter-term pipeline capacity purchases.
- A targeted percentage of the natural gas fuel price exposure is managed via a rolling 60-month structured financial natural gas hedging program.

- Through the Asset Management and Delivered Supply Agreement between Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress, LLC implemented on January 1, 2103, DEC serves as the designated Asset Manager that procures and manages the combined gas supply needs for the combined Carolinas gas fleet.

Fuel Oil

- No. 2 fuel oil is burned primarily for initiation of coal combustion (light-off at steam plants) and in combustion turbines (peaking assets).
- All No. 2 fuel oil is moved via pipeline to applicable terminals where it is then loaded on trucks for delivery into the Company’s storage tanks. Because oil usage is highly variable, the Company relies on a combination of inventory, responsive suppliers with access to multiple terminals, and trucking agreements to manage its needs. Replenishment of No. 2 fuel oil inventories at the applicable plant facilities is done on an “as needed basis” and coordinated between fuel procurement and station personnel.
- Formal solicitations for supply may be conducted as needed with an emphasis on maintaining a network of reliable suppliers at a competitive market price in the region of our generating assets.

DUKE ENERGY PROGRESS
Summary of Coal Purchases
Twelve Months Ended February 2021 & 2022
Tons

<u>Line</u> <u>No.</u>	<u>Month</u>	<u>Contract</u> <u>(Tons)</u>	<u>Net Spot</u> <u>Purchase and</u> <u>Sales(Tons)</u>	<u>Total</u> <u>(Tons)</u>
1	March 2021	221,728.00	49,040	270,768
2	April	159,723	36,359	196,082
3	May	98,095	-	98,095
4	June	147,937	-	147,937
5	July	169,614	24,638	194,252
6	August	73,921	168,609	242,530
7	September	133,922	121,974	255,896
8	October	122,146	86,378	208,524
9	November	136,575	148,046	284,621
10	December	48,856	208,029	256,885
11	January 2022	61,357	158,119	219,476
12	February	168,791	83,853	252,644
13	Total (Sum L1:L12)	1,542,665	1,085,045	2,627,710

Line

<u>No.</u>	<u>Month</u>	<u>Contract</u> <u>(Tons)</u>	<u>Net Spot</u> <u>Purchase and</u> <u>Sales(Tons)</u>	<u>Total</u> <u>(Tons)</u>
14	March 2020	63,516.00	25,179	88,695
15	April	205,573	(6,844)	198,729
16	May	37,639	(11,647)	25,992
17	June	13,060	(5,985)	7,075
18	July	205,293	(1,250)	204,043
19	August	280,431	-	280,431
20	September	292,974	-	292,974
21	October	281,434	12,427	293,861
22	November	244,691	24,851	269,542
23	December	293,006	-	293,006
24	January 2021	147,303	74,534	221,837
25	February	195,798	49,231	245,029
26	Total (Sum L1:L12)	2,260,718	160,496	2,421,214

DUKE ENERGY PROGRESS
Summary of Gas Purchases
Twelve Months Ended February 2021 & 2022
MBTUs

<u>Line</u>		
<u>No.</u>	<u>Month</u>	<u>MBTUs</u>
1	March 2021	11,672,834
2	April	9,833,075
3	May	10,394,016
4	June	14,427,637
5	July	16,994,787
6	August	16,866,819
7	September	13,052,405
8	October	12,424,350
9	November	14,950,650
10	December	15,166,665
11	January 2022	17,956,480
12	February	16,578,138
13	Total (Sum L1:L12)	170,317,856

<u>Line</u>		
<u>No.</u>	<u>Month</u>	<u>MBTUs</u>
14	March 2020	12,804,810
15	April	8,048,333
16	May	10,825,017
17	June	13,181,648
18	July	17,709,068
19	August	15,791,691
20	September	12,396,157
21	October	11,455,652
22	November	11,887,528
23	December	17,038,827
24	January 2021	15,211,307
25	February	12,301,205
26	Total (Sum L1:L12)	158,651,243